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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/893,455	06/29/2001	Hiroyuki Nishi	SKI.007D	7179

7590 11/06/2003
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EXAMINER

ORTIZ, ANGELA Y

ART UNIT PAPER NUMBER

1732

DATE MAILED: 11/06/2003

8

Please find below and/or attached an Office communication concerning this application or proceeding.

C10-8

Office Action Summary

Application No.

09/893,455

Applicant(s)

NISHI ET AL.

Examiner

Angela Ortiz

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 August 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 8-12 and 22-34 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 27-34 is/are allowed.
- 6) ☒ Claim(s) 8-12, 22, 23 and 26 is/are rejected.
- 7) ☒ Claim(s) 24 and 25 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) Z. 6) ☐ Other: _____

DETAILED ACTION

Drawings

The proposed and corrected drawings were received on 15 August 2003. These drawings are approved.

Claim Rejections - 35 USC § 102

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 8 and 12 are rejected under 35 U.S.C. 102(e) as being anticipated by Weber, USP 6,495,083.

The cited reference teaches the claimed method of manufacturing semiconductor devices including placing semiconductor mounted devices (12,14) within the cavity of a transfer mold having a top half (32) and a bottom half (34). During the molding process, as fluent resin reaches a desired level during filling of the cavity, the mold cavity pressure is controlled by the mold vent (46) by allowing excess to flow into cavity (42) so that a predetermined threshold pressure is not reached. Note that the claimed semiconductor chip is an integrated chip, and the claimed lead frame is a substrate. See col. 4, lines 28-67; col. 5, lines 1-35.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 9-11, 22, 23, 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsuzuku et al., USP 4,426,341 in view of Saeki et al., USP 4,954,301.

The cited primary reference substantially teaches the basic claimed method including transfer molding semiconductor devices using control means for optimizing the molding parameters. A predetermined pressure level is set prior to the initiation of the transfer molding operation. Movement of the plunger downward is initiated to force resin into the molding cavity. As the filling of the resin within the mold cavity progresses, the displacement of the plunger and the resin pressure inside the cavity is monitored by control means including a pressure sensor. When the maximum pressure

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is reached, the plunger is retracted and the relief valve opens. See col. 4, line 50 to col. 5, line 25; col. 5, line 37 to col. 6, line 36.

The cited primary reference does not set forth the claimed feature of determining the specified amount of resin in the mold cavity using distance and time traveled by the plunger.

The added reference teaches as conventional the molding process as claimed including the feature of measuring the distance traveled by the plunger to determine the fullness of the molding cavity. By measuring time and distance as an initial reference, transfer molding is performed as the plunger is moved downward at a desired velocity for a set amount of time and distance, the velocity is reduced after a desired period and then continued to fill the cavity. This prevents the plunger from impinging against the resin tablet at a high velocity to form voids in the molding resin even when the velocity is changed during different molding conditions. See col. 3, lines 39-45, 65-68; col. 4, lines 1-10, 40-68; col. 5, lines 1-10, 55-60; col. 6, lines 27-55.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to include plunger displacement and travel time means as set forth in the added reference, when performing the process set forth in the primary reference, as the displacement and time means prevent the plunger from impinging against the resin tablet and creating voids or air pockets within the molding resin.

With respect to claim 9, note that the mold set forth in the primary reference is not completely filled when the pressure is determined and is deemed readable on the claimed level "of about half", see col. 5, lines 55-60.

Response to Arguments

Applicant's arguments filed August 15, 2003 have been fully considered but they are not persuasive.

The applicant argues that the applied references do not disclose the newly claimed air pressure.

With respect to the applied Weber reference, note that the reduction of air pressure is inherent within the reference and would be reduced as the air escapes the mold cavity. See col. 4, line 15.

With respect to the Tsuzuku et al. and Saeki et al. references, one of ordinary skill in the art knows that air is present due to the problem of void formation. Note that the presence of air is further obvious in that the molding is not performed in vacuum, and thus when the internal pressure of the cavity is being monitored, it follows that air pressure would be included as well. See USP 4,426,341 at col. 6, lines 25-30.

Allowable Subject Matter

Claims 27-34 are allowed.

Claims 24-25 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Angela Ortiz whose telephone number is 703-308-4446. The examiner can normally be reached on Monday-Thursday 9:00-6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Colaianni can be reached on 703-305-5493. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

A handwritten signature in black ink, appearing to read 'Angela Ortiz', with a stylized flourish at the end.

Angela Ortiz
Primary Examiner
Art Unit 1732

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